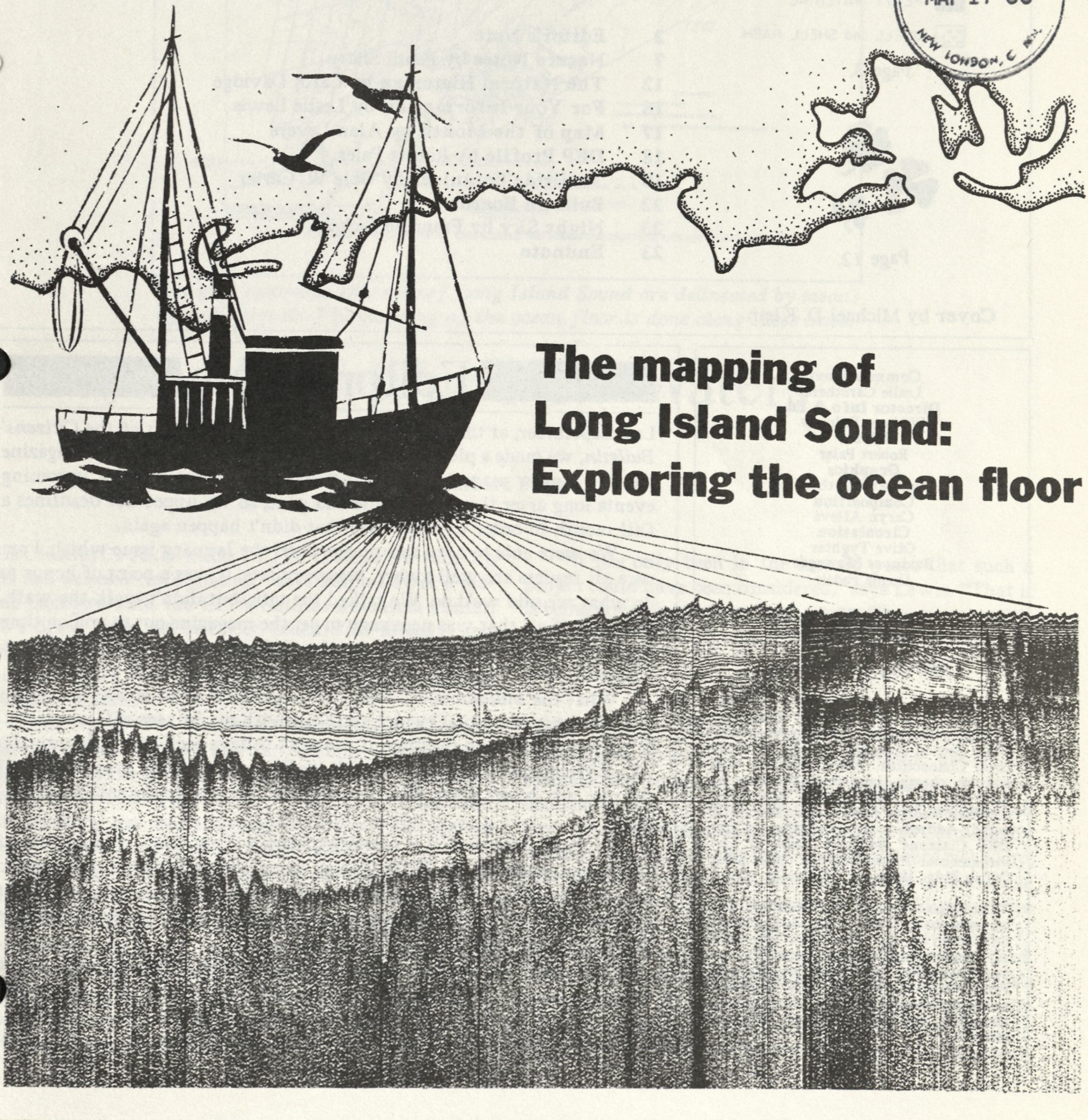
CT DOCS
En90
Cb
v.15, no.7
Item 10B

Citizens' Bulletin

Volume 15 Number 7 March 1988 $5/yr. The Connecticut Department of Environmental Protection

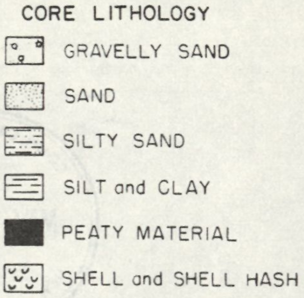
CONN COLLEGE LIBRARY
MAY 17 '88
NEW LONDON, CONN.



The mapping of Long Island Sound: Exploring the ocean floor

Citizens' Bulletin

March 1988
Volume 15 Number 7
$5/year



Page 3.

Page 12.

Cover by Michael D. Klein

Features

3 **Mapping Long Island Sound** by Robert Paier
New technology allows us to penetrate the unexplored frontier in our front yard.
10 **The Blackledge River Watershed Project**
A pilot project follows natural rather than political boundaries.
14 **Lawnmowing for the 21st Century** by Maryanne Lincoln
The very latest in low-tech.

Departments

2 **Editor's Note**
7 **Nature Notes** by Penni Sharp
12 **The Natural Historian** by Carol Davidge
16 **For Your Information** by Leslie Lewis
17 **Map of the Month** by Alan Levere
18 **DEP Profile** by Robert Paier
19 **Trailside Botanizer** by Gale W. Carter
22 **Bulletin Board**
23 **Night Sky** by Francine Jackson
23 **Endnote**

Commissioner
Leslie Carothers
Director Info & Ed
William Delaney
Editor
Robert Paier
Graphics
Rosemary Gutbrod
Composition
Caryn Alleva
Circulation
Olive Tyghter
Business Manager
Donna Fadoir

Phone
566-5524

DEP Citizens' Bulletin

Published 11 times a year by the Department of Environmental Protection. Yearly subscription, $5.00; two years, $9.00. Second class postage paid at Hartford, Connecticut. Please forward any address change immediately. Material may be reprinted without permission provided credit is given, unless otherwise noted. Address communications to Ed., **DEP Citizens' Bulletin.** Dept. of Environmental Protection, Rm. 112, State Office Bldg., Hartford, CT 06106.

"The Connecticut Department of Environmental Protection is an equal opportunity agency that provides service, facilities and employment opportunities without regard to race, color religion, age, sex, physical or mental disability, national origin, ancestry, marital status, or political beliefs."

Editor's Note

Last September, at the beginning of this publishing year of the *Citizens' Bulletin*, we made a pledge to our readers that we would get this magazine out in a timely manner. It is at best irritating to get news of upcoming events long after they have come and gone, so we upped our deadlines a full month in order to make sure that didn't happen again.

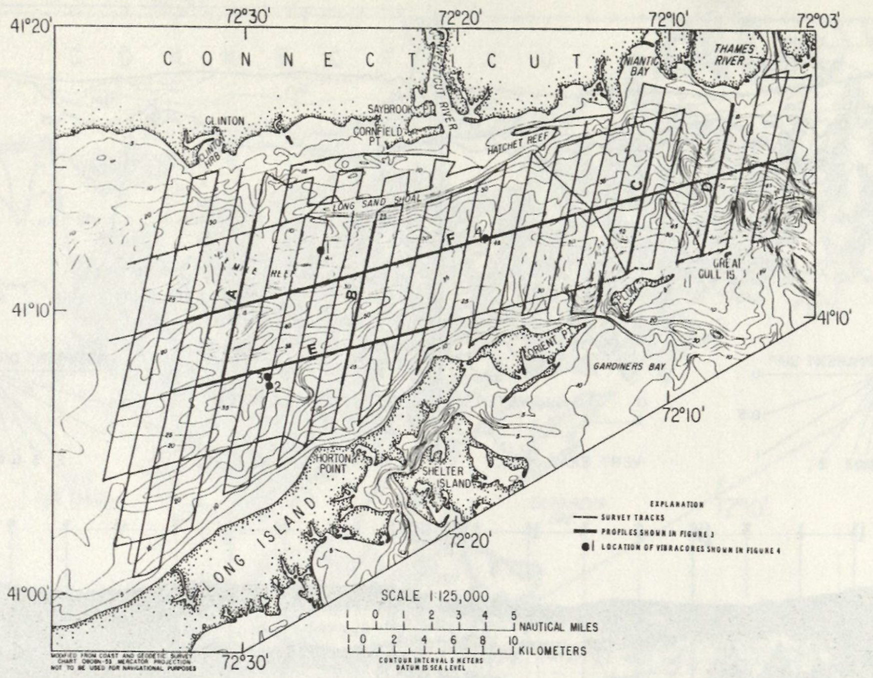
We were able to keep this pledge until the January issue which, I am sure all readers are well aware, was very late. It was a point of honor to do what we said we'd do. We talked the talk, but didn't walk the walk. Not good. If all that was necessary to get the magazine out to you on time was a pint or two of fresh blood, the *Bulletin* would have been there. Unfortunately, more was required, and we couldn't do it.

What the *Bulletin* is all about, what the DEP is all about, is keeping a relationship of mutual respect and trust with the citizens of Connecticut. If we're not working together, if we can't believe each other, then things like *Environment/2000*, the Blackledge River Watershed Project, and all the rest, just won't work. It's a team effort. Everybody depends on everybody.

As usual, however, it is possible to derive some comfort from our old friend and neighbor, Mr. Mark Twain, who says that it's not necessary to explain anything. Your enemies, he says, won't believe you, and your friends don't need explanations. So, with that, we get up, dust ourselves off, and try, try again.

Hope you enjoy this issue of the *Bulletin*. Hope you get it on time.

R.P



SEA-FLOOR TOPOGRAPHY, LOCATION OF HIGH-RESOLUTION SUBBOTTOM PROFILES, AND VIBRACORE LOCALITIES.

The grid squares in this map of Long Island Sound are delineated by means of radio signals. The mapping of the ocean floor is done along these lines.

Charting New Waters

by

Robert Paier

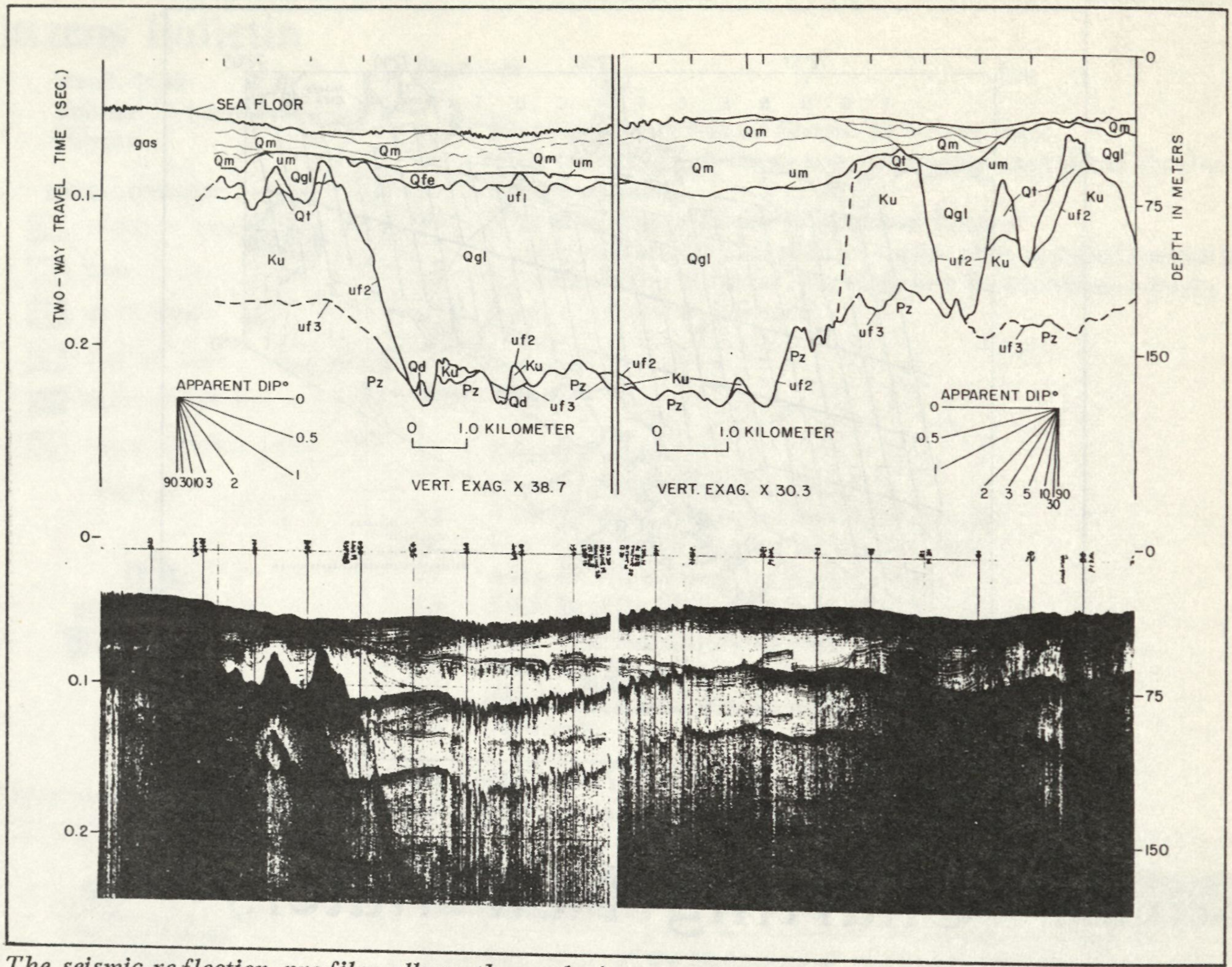
"GEOLOGISTS ARE LIKE DETECTIVES. We pick up bits and peices of information," says Ralph Lewis, a marine biologist with the DEP's Natural Resources Center. "We draw on what has been indentified already, and then, using that body of knowledge and our own work, we try to tell a story. Being a geologist is a lot like being Sherlock Holmes."

Since April, 1981, Lewis has been the head of one of the DEP's most exciting and far-reaching projects. In a joint effort of the DEP's Natural Resources Center and the United States Geological Survey (USGS), Lewis has been doing nothing less than mapping the bedrock and surface geology of the floor of Long Island Sound.

Long Island Sound sits right in our front yard; it is critical to the life and character of Connecticut, and yet this is the first time such a study has been undertaken in such detail. Long Island Sound is so close and important to us, yet many of its features have remained a mystery. Now, for the first time, the secrets of Long Island Sound are being revealed. Ralph Lewis is mapping what has never been mapped before.

"It has only been in the last 40 years that such a project could have been considered," says Lewis. "That it is being done now reflects both a growing environmental awareness and the fact that new technology allows us to do these things."

LONG ISLAND SOUND has been divided into a series of grid squares in order to use new electronic navigation systems. The squares are made not by means of visible boundaries, but by radio signals, which are transmitted from stations in Maine, Cape Cod, and South Carolina. By using a radio receiver on a boat, these signals are picked up, time delays are calculated, and it is possible to determine exactly the boat's location at any time. By holding a course at one particular setting, it is possible to go in clearly-defined, straight lines back and forth across the Sound. These lines form the grid system on which all of Lewis's measurements are taken. Tuned in to the Long Range Navigation (LORAN) frequencies, Lewis chugs along in his "jeep," a re-outfitted lobster boat. He cruises at a speed



The seismic-reflection profiler allows the geologists to gain a greater understanding of underlying strata and bedrock.

of five knots, and on a good day, he can cover 40 nautical miles. In the past four years, Lewis and his crew have logged 2700 kilometers along these grid lines.

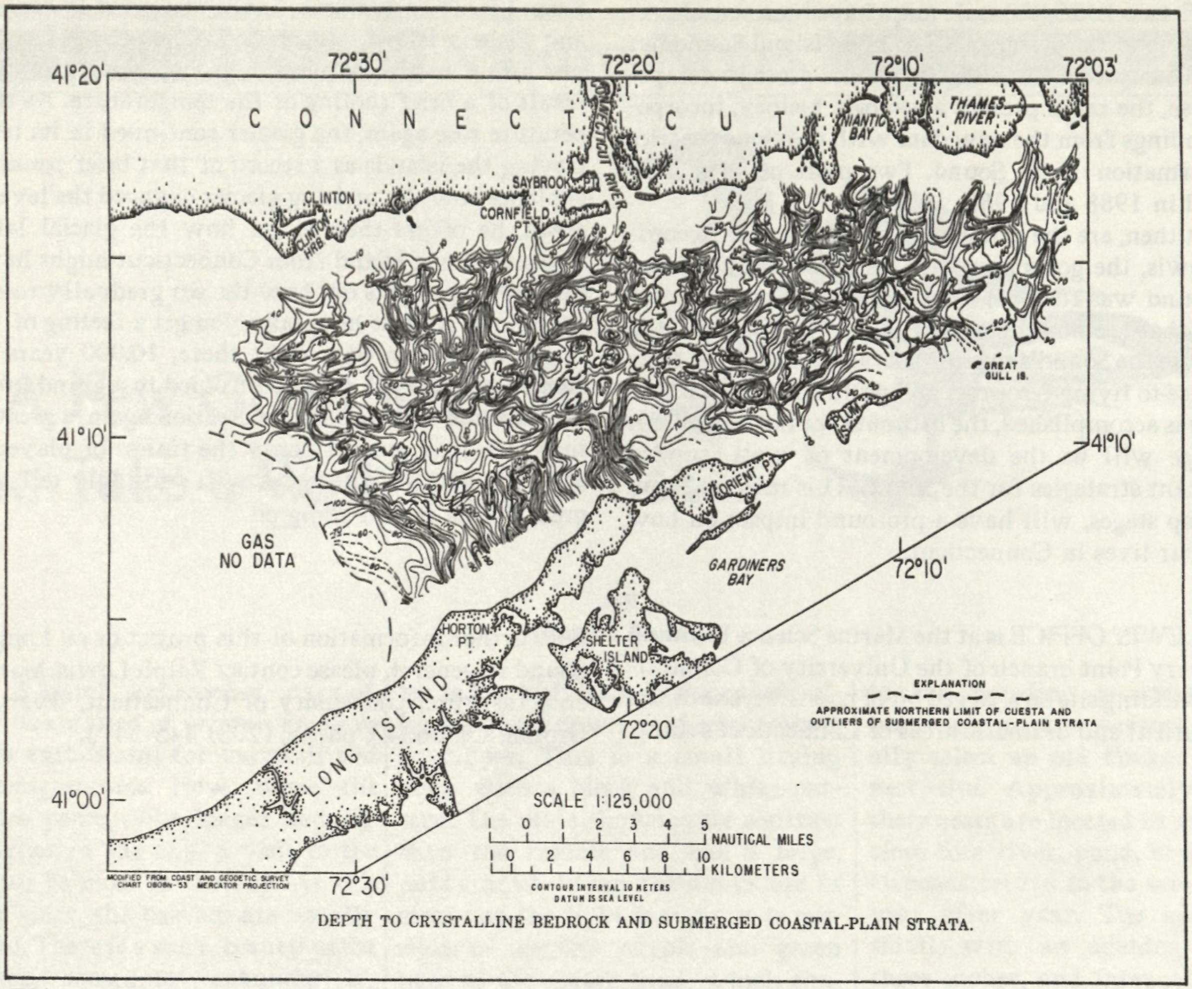
In order to do the mapping itself, Lewis relies on "remote sensing" devices, equipment which allows him to see the unseen. A seismic-reflection profiler is basically an ultrasound system. Sound waves are transmitted from the boat straight down to the bottom of the Sound below. By analyzing the sound waves as they reflect back, Lewis is able to determine the shape and makeup of the bottom, as well as gain a greater understanding of the underlying strata and the bedrock level.

At the same time this system is in operation, another system, called the side-scanner SONAR, is also working. A SONAR "fish" is pulled along behind the boat, gliding above the floor of the Sound. SONAR sensors go out on both sides of the fish, creating a picture of the actual surface, to include, boulders, hills, shipwrecks, etc. It was this device which enabled searchers to find so much of the ill-fated *Challenger*.

In addition, Lewis and his crew will on occasion use the core sampler, a 30-foot drill which takes a five- to 15-foot vertical sample of actual material from the bottom, and makes cross-checking and very detailed analysis possible. Of course, because of the considerable expense involved, cores may only be taken infrequently. And, beyond that, Lewis does – on occasion – climb into a small, two-man submersible. This highly-equipped submarine has been provided by the National Undersea Reaseach Program (NURP), and is used in joint projects b the DEP and that program.

FROM THIS ACCUMULATED DATA, we are learning a great deal. While it is not possible to get an absolutely precise, foot by foot, picture of the bottom, we do have information along the grid lines. From this, geolgists interpolate what the big picture is like. "It would be like mapping the geology of Connecticut using only the information you could gather along the roads," says Lewis. New and fascinating data are now available, but there is still a job for the Sherlock Holmes geologist.

What are the implications of this research? What will it do to make our lives better? "It takes nearly the en DEP, with all its staff and different fields of expertise, to address the land area of Connecticut," says Lewis. "The



DEPTH TO CRYSTALLINE BEDROCK AND SUBMERGED COASTAL-PLAIN STRATA.

This map indicates depth at the eastern parts of Long Island Sound. From all the accumulated information, geologists interpolate what the big picture is.

fact is, however, that Long Island Sound, with its complex and interrerlated ecosystems, its natural resources, varied habitats, and wildlife, requires a similar kind of management. We hope, with our research, to be ready with a long-term management plan for Long Island Sound by the year 2000."

Certainly the pressure from development, experienced throughout Connecticut, also has its effect on the Sound. If we are to avoid being overwhelmed by the demands of the future, it will be necessary that this area be carefully managed in terms of mining, fisheries, boating, recreation, as well as for pollution. Lewis gives a clear example of how his studies relate to a contemporary pollution problem. Heavy metals, which have been found to cause danger to the environment and to human health because of their resistance to chemical breakdown, tend to accumulate in certain fine-grained sediments. What this means is that if high levels of pollution are found in one area – New Haven, for example, where the bottom is mostly sediment – it is possible that the origin of some of the pollution may be somewhere else. Pollutants carried from other areas may be preferentially adsorbed by a fine-grained material and not adsorbed by inert quartz sand. Tracking down pollution sources will require a good knowledge of sedimentation patterns in Long Island Sound.

THE DISCOVERY of relatively modern sediment in the central Sound was just one of the many surpises Lewis has encountered. Another is that there are large "sand waves," dunes on the Sound floor, ranging from 60 to 100 feet high. According to Lewis, these are similar to the sand dunes of the Sahara Desert. "This is just another example of how dynamic the Sound is. Over one life-time, which is how most of us view things, there isn't much change. From the vantage point of geologic time, however, things get very dramatic."

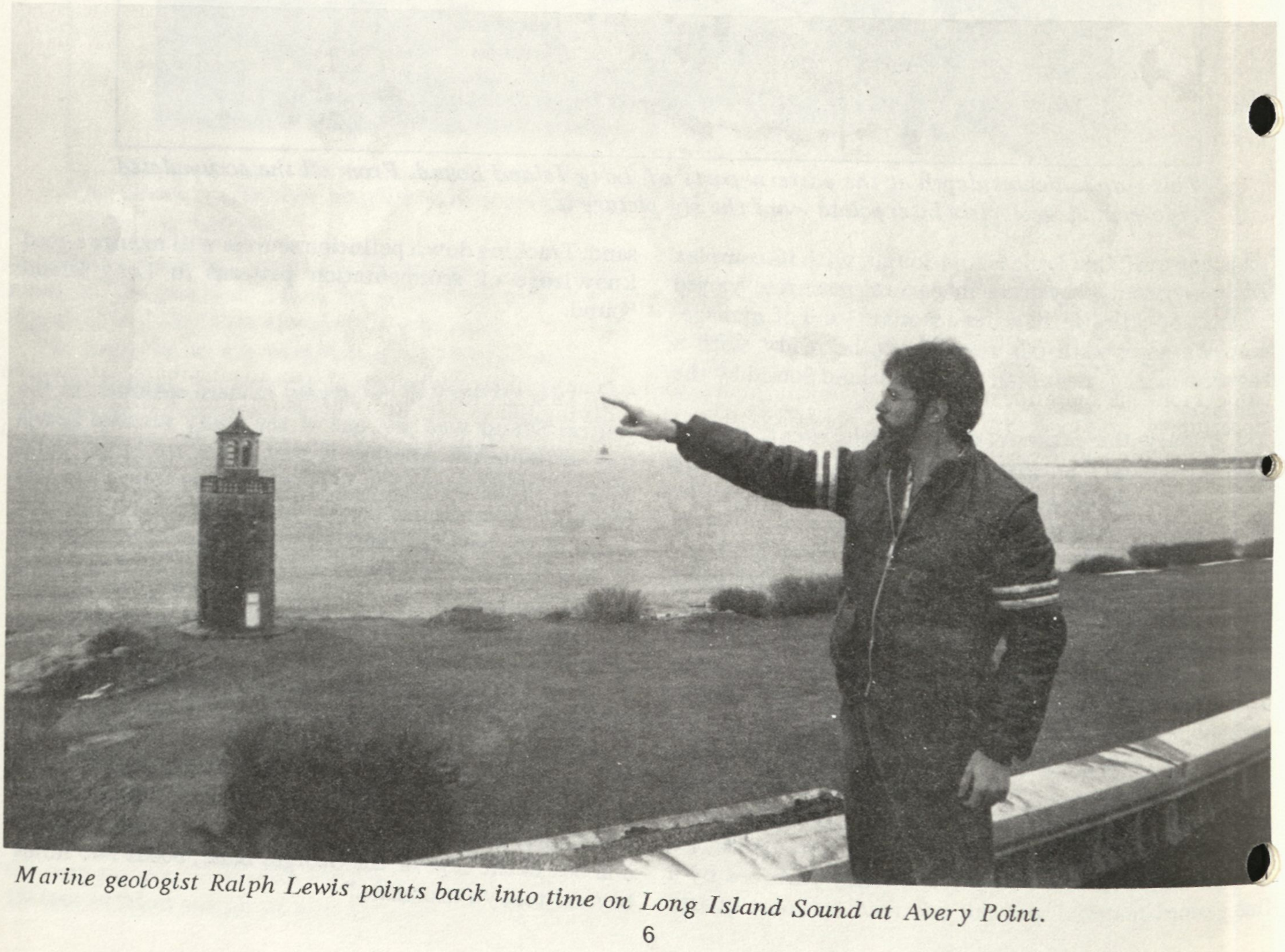
Lewis is clearly comfortable discussing events in terms of tens of thousands of years. "There was a time when you could have stood on Long Island and watched the glacier receding back over Connecticut. We have evidence that the ocean was several hundred feet lower at that time, and it would have been possible to ride a mastodon out to the edge of the Georges Bank, about 200 miles beyond today's shoreline."

TO DATE, two 1:125,000 scale maps have been completed. The mapping of the eastern half of Long Island Sound has now been completed, showing depth and geologic components. Also, the maps present a geologic history, incorporating findings from the new data with previous theories on the formation of the Sound. Two more maps will be published in 1988 and 1989.

What then, are the primary goals of all this? According to Lewis, the goals are: 1) to understand how Long Island Sound was formed; 2) to understand the physical processes that are now operating in the Sound; and 3) to characterize the Sound's components and understand their importance to living resources and pollution distribution. Once that is accomplished, the ultimate application of this knowledge will be the development of well-founded management strategies for the Sound. This research, now in the map stages, will have a profound impact on how we live our lives in Connecticut.

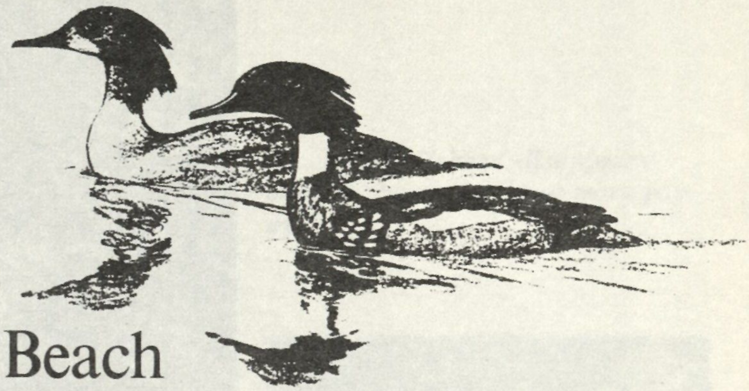
RALPH LEWIS' OFFICE is at the Marine Science Building at the Avery Point branch of the University of Connecticut. The building sits on a jagged bit of coastline, one of the most beautiful and dramatic areas of Connecticut's shore. From his office window, Lewis can point to Plum Island and Fishers Island. He explains how the glacier paused just a few moments in vast, geologic time, the probable result of a brief cooling of the temperature. As the temperature rose again, the glacier continued in its recession, leaving the islands as a record of that brief pause. Lewis explains how the melting glacier changed the level of the ocean, he offers theories on how the glacial lake that separated Long Island from Connecticut might have been drained, and points out how the sea gradually rose to fill the Sound. And, as he speaks, you get a feeling of what it might have been like, right there, 10,000 years ago, as elemental forces of nature unfolded in a grand process of creation and destruction and creation again, a great drama in which man is really only the tiniest of players. And, as Lewis and his colleagues will smilingly tell you, the great drama is still going on.

For further information of this project or on Long Island Sound in general, please contact Ralph Lewis, Marine Science Institute, University of Connecticut, Avery Point, Groton, CT 06340; phone: (203) 445-3473. ■



Marine geologist Ralph Lewis points back into time on Long Island Sound at Avery Point.

Nature Notes



A Few Good Reasons to Take a Walk on the Beach

by
Penni Sharp

AS March approaches, most of us are tired of winter; we have lost our enthusiasm for snowfall and cold temperatures. Now, when the days are perceptibly longer and the sun higher in the sky, a visit to the coast can be most rewarding. At this time of year, the beaches are usually deserted. There is a stark beauty to the shoreline, sometimes enhanced by strange salt water ice sculptures. To my mind, the winter months are probably the best time to visit one of Connecticut's coastal state parks. You may not find complete solitude, but the crowds of the summer are definitely absent, and the sea air most invigorating. From the shoreline, one has the opportunity to look for wildlife species that can usually be seen in Connecticut only during the winter months.

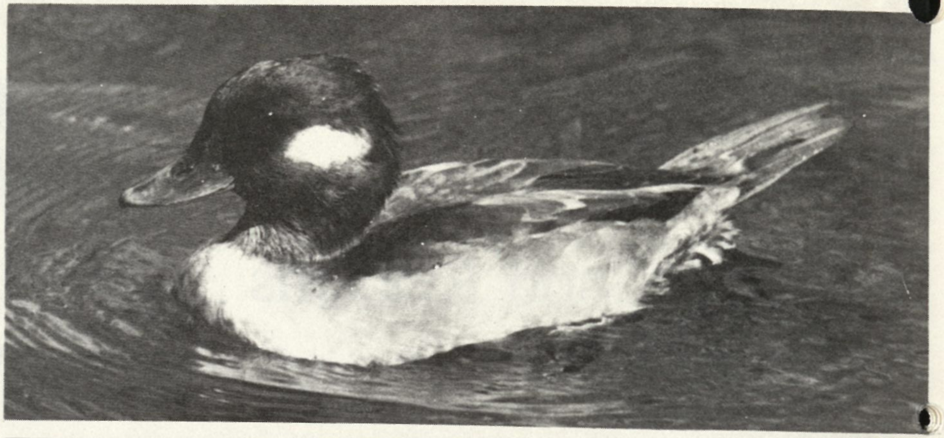
Many migrating animals which have left our area for southern realms begin now to return, and that is a sign of winter's release. But, there are other animals which have moved from the north country to "mild" Connecticut for the winter time. Many of these animals inhabit coastal waters during their stay.

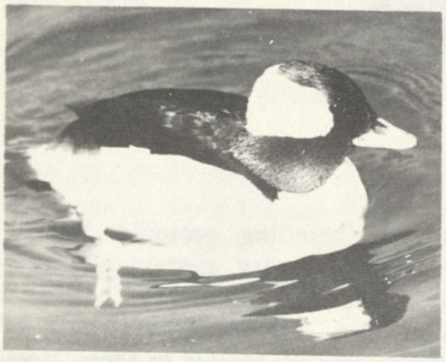
AMONG my favorite ducks that visit our shores in winter is the bufflehead (*Bucephala albeola*), also known as the butterball or dipper. This is a small diving duck with a black and white pattern. The male shows more contrast than the female and has a large, puffy head. When the ducks are in close and the light is right, it is possible to see the purple and green hues of the male's head, which contrast with the large white crown patch. The male is white below and black above, whereas the female has a brown-black head with a small white dot behind the eye and is not as distinctly black and white. Buffleheads usually gather in small flocks of 10 to 12. They appear to be playful in their diving. They sit low in the water, sometimes so low that their tails are awash.

During winter, buffleheads concentrate along the Pacific and Atlantic coasts. Those along the east coast are some distance from the breeding range, which includes British Columbia, Ontario, Quebec, and parts of the northwestern United States. The breeding grounds are large boreal forests of rather mountainous country.

Buffleheads breed after they have reached the age of two. During late March and early April, they begin to form pair bonds; this behavior coincides with their migration to the breeding grounds. Buffleheads are cavity nesters, and usually select an old flicker hole as a nest site. Approximately half of their nests are located in aspen trees, close to a river, pond, or lake. Buffleheads return to the same nest site year after year. The cavities are small, with an opening of about three inches, and internal diameter of about six inches, and a depth of 10 to 12 inches. Cavities are usually two to 10 feet above the ground. In the nest, the female lays from five to 20 eggs at an average rate of one egg every day and a half. The male, or drake, remains nearby until the hen starts to incubate, at which time he usually leaves the area. Occasionally, a drake will remain with its mate throughout the incubation period.

May is the nesting month, and the incubation period lasts from 28 to 33 days. Following the hatch, the young remain in the nest for about a day before jumping to the ground. For a tiny, flightless duckling, the trip out of the nest must be a frightening experience. Those who have witnessed the exit report no release call from the mother, and it is not known what triggers the event. The female leads the brood to open water where she keeps watch until the time of molt when there





A winter visitor to our shores is the bufflehead duck, also known as the butterball or dipper. (Photos: L.L. Rue III.)

is more intermingling among broods.

Buffleheads feed on a variety of aquatic organisms. At freshwater areas, the bulk of the diet comprises aquatic insects, including dragonflys, damselfly and mayfly nymphs. In salt water, crustaceans, mollusks, and fish are the primary winter foods.

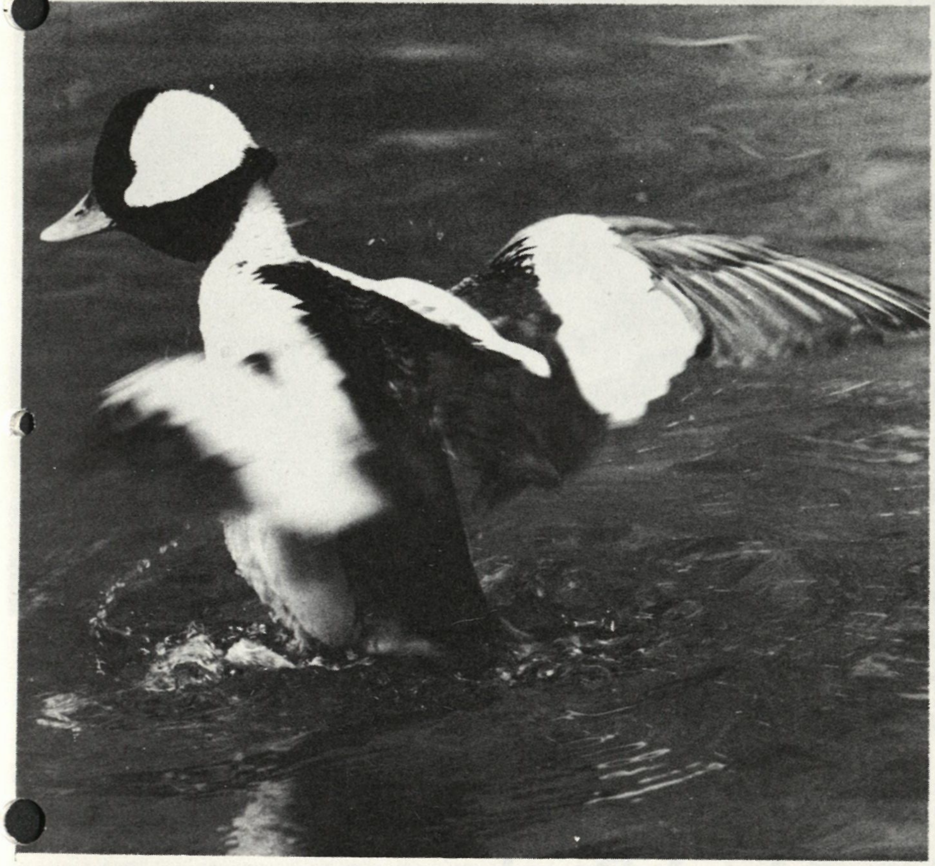
Buffleheads are entertaining to watch. As one disappears beneath the water's surface, two more will pop up. They are extremely active, and seem to be forever diving and resurfacing.

ANOTHER handsome duck seen off the coast in winter is the red-breasted merganser (*Mergus serrator*). Flying in pairs or small flocks off shore, the ducks keep close above the water with rapid wing beats. The red-breasted merganser is a long and slender duck and has a streamlined look, particularly in contrast to the bufflehead.

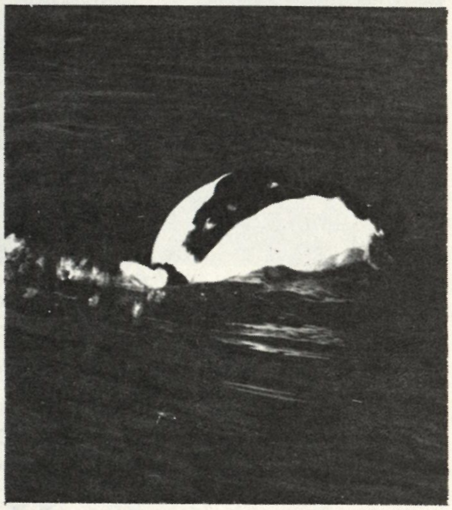
From a distance, the male red-breasted merganser shows a band of white that extends nearly the full length of the body. It has a dark green head, a bright white neck band, and rust-colored breast. The females and immatures are not as dramatic in coloration; they have cinnamon-brown heads and grayish backs and sides. The female has a white wing patch, though it is not always visible. Both male and female have crested heads and red bills. The bill is long and pointed, with sharp, toothlike serrations.

The red-breasted merganser breeds in the north country, including most of Canada and Maine, and winters primarily along the coast. This merganser migrates north to its breeding grounds in late spring, arriving from mid-May to mid-June. The red-breasted merganser fashions its nest on the ground and will often return to the same area each year. Nests have been found on piles of driftwood in the middle of lakes, in abandoned igloos, in marshes, under shrubs, and beneath rocks, but usually close to water. The merganser lines its nest with a thick layer of down, and lays from five to 11 eggs. These ducks, like many others, occasionally lay eggs in the nests of other ducks. The eggs are incubated for about 40 days, and following the hatch, broods may form small flocks. Like the buffleheads, male red-breasted mergansers usually depart the breeding grounds during the time of incubation and leave the rearing of the young to the hens.

With their streamlined bodies and serrated bills, red-breasted mergansers are efficient catchers of fish, and fish comprise the bulk of their diet. They dive for their fo[illegible] and are able to swim underwater. These ducks have been known to



As one bufflehead disappears beneath the surface, two more pop up.



coordinate their fishing efforts in that several will group together and drive fish into shallow waters where they are easily caught.

ANOTHER interesting bird to look for from the shoreline is the horned grebe (*Podiceps auritus*). With a superficial resemblance to ducks, grebes belong to a different family of birds, the *Podicipedidae* family. Lobed feet and pointed bills distinguish them from ducks. Unlike ducks, when startled, grebes tend to dive rather than fly. Grebes have smallish wings; thus when they do fly, they need ample room to skitter across the water to become airborne.

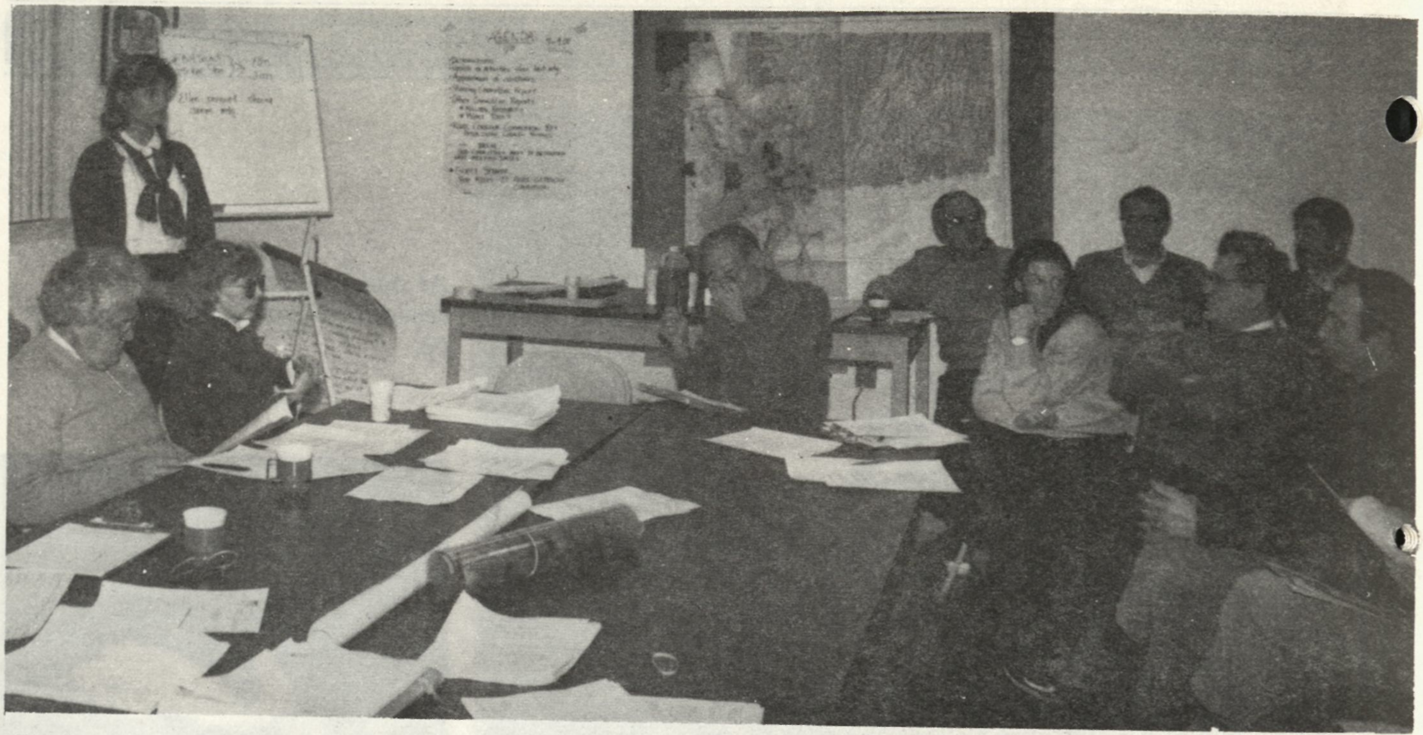
The horned grebe is a rotund little bird which, in winter, is gray above and white beneath. Its breeding plumage is more colorful; during this season, the bird sports a chestnut-colored neck, dark head, and buff-colored ear tufts.

The horned grebe is an excellent swimmer and, like others of its family, moves underwater primarily by the aid of its feet. The grebe has the ability to empty its air sacs and just sink beneath the water without a ripple. When resurfacing, grebes may expose only the bill above the water, causing those watching to wonder at their seeming disappearance.

The horned grebe breeds further north in freshwater marshes. The female lays from two to seven eggs in a most unusual nest. The nest, which floats, is made of water-soaked, decaying vegetation attached to marsh grasses. When the young hatch, they are covered with down and are able to swim and dive immediately. The grebe is a popular photograhic subject, as the young chicks frequently ride upon their parent's back.

Grebes feed primarily on fish and small aquatic organisms. They are also known to ingest their own feathers. It is thought that the feathers act as a filter and trap fish bones, preventing them from entering the intestines until they have been broken up by digestion. The horned grebe is a frequent winter visitor along our coastline. If you notice a small, solitary, grayish bird that dives beneath the water, chances are that it is a horned grebe.

THE MILD DAYS at winter's end are good ones to look for some of our winter visitors. As we await the return of our summer residents, we might also give thought to the animals that have left the extremely cold climes to winter over with us. And, best of all, it's a wonderful excuse to take a day off and enjoy the peace, solitude, and beauty of Connecticut's beaches. ■



Denise Schlener addresses a group of Connecticut residents in a pilot project which may set the trend for similar projects in the state.

The Blackledge River Watershed Project

Private citizens continue to take responsibility for protecting the environment

INCREASINGLY, there are indications that we are entering a new phase of the environmental era. We see, more and more, examples of well-informed and concerned private citizens actively taking on the burden of protecting the environment in their backyard; they see that it is in their own best interests, that it is their environment, that they have a personal responsibility for its protection. And, further, we see a trend toward awareness of things beyond political boundaries, a sense of being part of broader, natural ecological systems. Both these trends are evident in the formation of the Blackledge River Watershed Committee. In this committee, concerned and knowledgeable Connecticut residents have looked at where they are and where they are going, and have decided to do something about it. They have initiated action which requires the cooperative efforts of several towns working toward a common goal. This project is one of the first of its kind, and is being watched carefully by many levels of government. It is now a pilot project. It may well be a signal for similar projects across the state, and beyond.

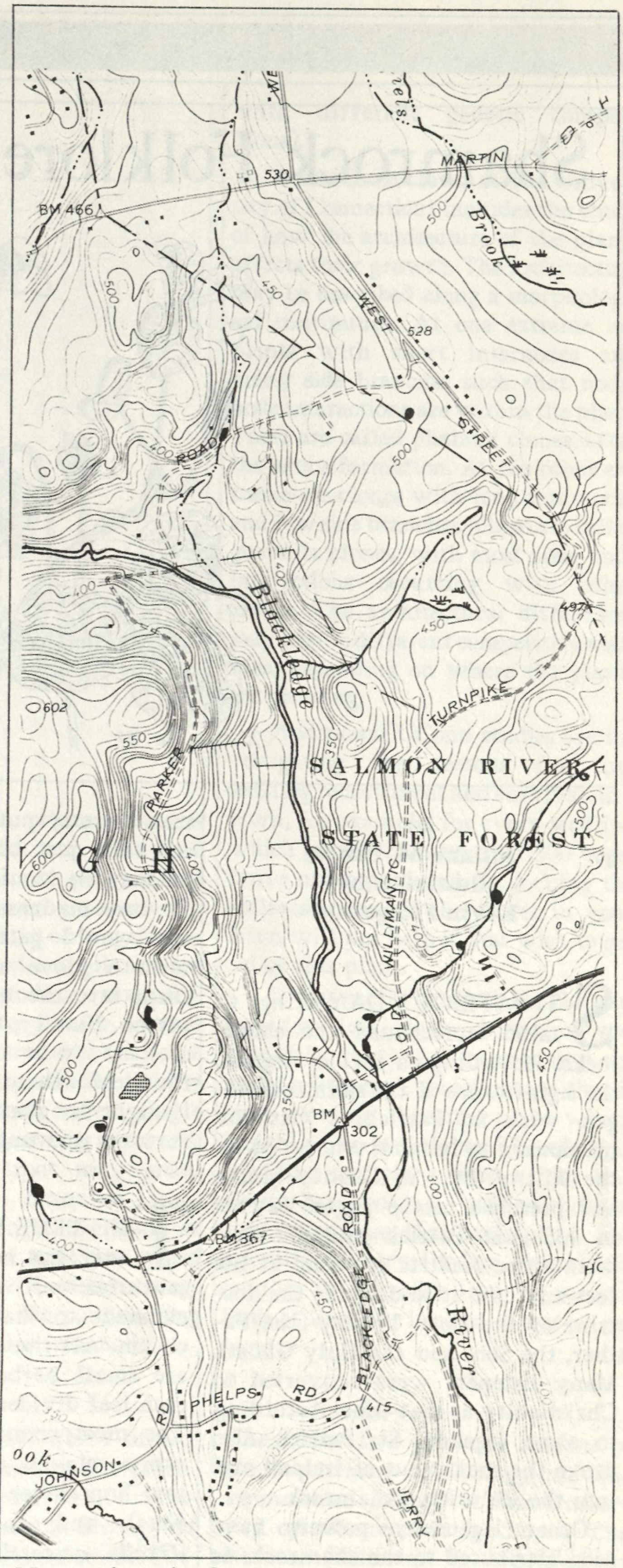
DENISE SCHLENER, regional director of the Connecticut River Watershed Council, has been instrumental in this project from its beginning. In an article in the *Habitat*, the newsletter of the Connecticut Association of Conservation and Inland Wetlands Commissions (CACIWC), she stated the goals of this project were to "protect and guide the use of land and water resources." The initial target was the Salmon River Basin, a place of near pristine environmental conditions. It was then determined, however, that the greatest threat of uncontrolled development was in the Blackledge River Basin – a subset of the Salmon -- which involved the towns of Bolton, Glastonbury, Marborough, Hebron, and Colchester. Having focused on that particular area, a reconnaissance survey of natural features was performed to obtain a clear understanding of the overall natural systems present in the Basin. Wetlands, watercourses, wildlife habitat, and open spaces were mapped, as well as zoning restrictions and known water quality problems. What became clear was that in order to address the true situation, in order to make recommendations which would reflect the ecological integrity of the area, it was going to be necessary to take a perspective beyond that of the town boundaries.

At that point, it was time to go public. The project was opened up to any and all concerned citizens, town officials, and landowners -- in short, to anyone with an active interest in the future of the Blackledge Basin. The Blackledge River Watershed Committee was formed, drawing its membership from the 35 people who stood up to offer their time and energy to bring this about. Task forces were then created to make a complete inventory of the natural and cultural resources of the area and to determine the management and protection tools available.

On January 15, the members of the committee met at the Marlborough Town Hall. One of the first orders of business was the appointment of Ellen Miller-Wolfe, of Marborough, and Jim Murphy, of Hebron, as co-chairs of the steering committee. Denise Schlener and Mary Beth Binns, of the Connecticut River Watershed Council, then reviewed program goals, and outlined an eight-month work plan for funded and public involvement. Peter Stern, of Glastonbury, and Carolyn Hughes, of Hebron, gave progress reports from task forces. Robert Myers, a member of the Connecticut River Gateway Commission, offered suggestions based on his experience in working with an entity greater than single-town boundaries. Further meetings were scheduled for the coming months.

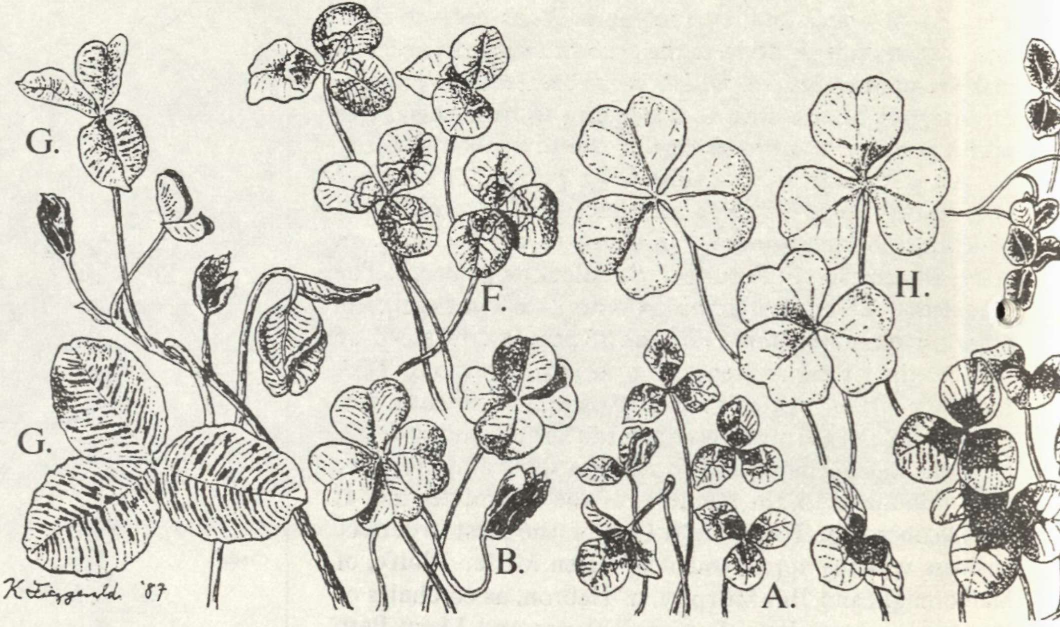
ONE OF THE INDICATORS of the future of this project is that it will work in conjunction with, and draw on the assistance of, other projects which are under way in the Basin. This area is currently being studied by the DEP's Bureau of Fisheries, as the future of the Basin is crucial to the DEP's salmon restoration program. Also, the DEP's Natural Resources Center is in the process of compiling a detailed computerized data base of that region. That these efforts are occurring simultaneously with the Blackledge project highlights the importance and ultimate potential for achieving comprehensive natural resource protection.

The BRW Project will be a pilot project in Connecticut. It is significant not only for what it may accomplish in its immediate target area, but also for the possibilities of similar efforts in other areas in the state. Those interested in participating in this project should contact Denise Schlener, Connecticut River Watershed Council, 102 Constitution Plaza, Hartford, 06103; phone: 277-6914.



Maps of wetlands, watercourses, wildlife habitats, open spaces, zoning restrictions, and water quality problems are being coordinated in the BRW Project.

Shamrock Folklore



by
Juliana M. Panos
Illustration by
Kevin Fitzgerald

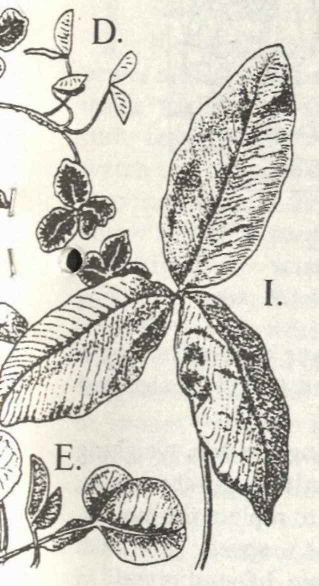
ST. PATRICK'S DAY brings to mind leprechauns and shamrocks. According to fact or legend, the significance of the shamrock began with St. Patrick, a Catholic missionary to Ireland, who stood on the Hill of Tara in County Meath and preached to the pagan natives in 432 A.D. Patrick picked a leaf with three leaflets growing at his feet and used it to describe the doctrine of the Holy Trinity (the Father, the Son, and the Holy Ghost). Many listeners were converted to Christianity at that time. According to some legends, St. Patrick also drove the snakes out of Ireland and into the sea with a shamrock.

Other legendary powers have been attributed to the shamrock, as well. It was believed that anyone carrying a shamrock would be able to detect evil spirits. If a young woman secretly put one into her lover's shoe just before he left on a journey, he would be sure to return. To cure madness, it has been said, one would gather up shamrocks with a glove and secretly bring them into the home of the insane person. Finally, the most powerful of all was the hard-to-find four-leaf shamrock which was thought to guard against all misfortunes and unhappiness.

THE TRUE SHAMROCK, however, has remained elusive for centuries, as many plants are claimed to have the good-luck charm. All the so-called shamrocks are small herbaceous plants with each leaf divided into three leaflets. The most common shamrocks are white clover (*Trifolium repens*), low hop clover (*Trifolium procumbens*), and common woodsorrel (*Oxalis acetosella*). Flowers range from white to yellow to pink, respectively. The grocery stores and florist shops in Connecticut usually sell one of the *Oxalis* species for S Patrick's Day.

The search for the true shamrock dates back to 1892 and 1893 when Nathaniel Colgan, an Irish botanist, conducted two yearly searches. He asked each county in Ireland to send him samples of the true shamrock. The first year, he received *T. procumbens* and *T. repens*. The second year, he received those two species, along with red clover (*T. pratense*) and spotted medick (*Medicago arabica*). He was never sent *Oxalis*, which we so commonly see today.

REGARDLESS of which species the shamrock really is, fascinating history and folklore sprang up around the term. Historically, the word "shamrock" is believed to have first been used in English literature in 1571 A.D. The Irish actually used the shamrock for food, and references are made eating "shamrogh," "shamroke," "shamroote," and "shamrug." In



A. Trifolium repens (*white clover*)
B. Oxalis (*includes four leaved clover which is a mutant*)
D. Trifolium repens (*white clover, Queen's clover*)
E. Trifolium repens (*white clover*)
F. Trifolium repens (*white clover*)
G. Trifolium repens (*white clover – another variety of Queen's clover*)
H. Oxalis acetosella (*grows widely, becomes a pest in lawns; not a true*)
I. Trifolium pratense (*red clover*)

1638, the Earl of Antrim wanted to eed an army of 8,000 on shamrocks. An Oxford physician, Henry Mundy, wrote that those who eat shamrocks would be swift and strong. Colgan determined that it was the red and white clovers which were used as human food until about 1632.

All the species mentioned here may be found in Connecticut – in yards and fields or along forest paths. One of the easiest to find is white clover. Although it is sometimes considered a nuisance in lawns, white clover is a very important forage crop. Sown both alone and with grasses, white clover provides a nutritious source of pasture and silage for livestock. In addition, white clover may be inoculated with symbiotic bacteria which fix atmospheric nitrogen. This provides a natural nitrogen source for plants growing in association with clover. Clover is also n important food plant, yielding nectar for honey bees.

In addition to its importance as an economic plant, white clover is an ideal species for the study of clonal plants. A clonal plant is one which reproduces asexually through the growth of vegetative units. Almost all clonal plants are also able to reproduce sexually. Growth in white clover occurs along an above-ground stem called a stolon. Nodes are produced as the stolon grows. At each node a single leaf is produced growing upward, and sometimes a root may grow downward. Side branches may sometimes grow from the buds at the nodes. The next time you weed your lawn, you will easily recognize the nodes and the connnecting pieces of stolon called internodes.

A VAST ASSORTMENT of clover is contained in the greenhouses of the Department of Ecology and Environmental Biology of The University of Connecticut. Different patterns and coloration of leaves are sometimes used to identify different genotypes (plants with different genetic compostions).

Research on clover at The University of Connecticut includes the study of how the architecture of the plants affects their growth. The architecture may be described along a morphological continuum. At one extreme are plants with short internodes and many side branches such that node-node interactions are within the plant. These are called phalanx clones, after the army formation. At the other extreme are clones with long internodes and few side branches. These are called guerrilla clones, with most node-node interactions occurring with other plants. The architectural differences may lead to different competitive abilities, depending on where the plants are growing.

Additional UConn studies are investigating the reasons for low seedling recruitment and survival. In a lawn, for example, for every seedling which grows there are over 500 vegetative nodes produced. So, picking the inflorescences off the clover in your lawn will not help if you wish to get rid of this plant.

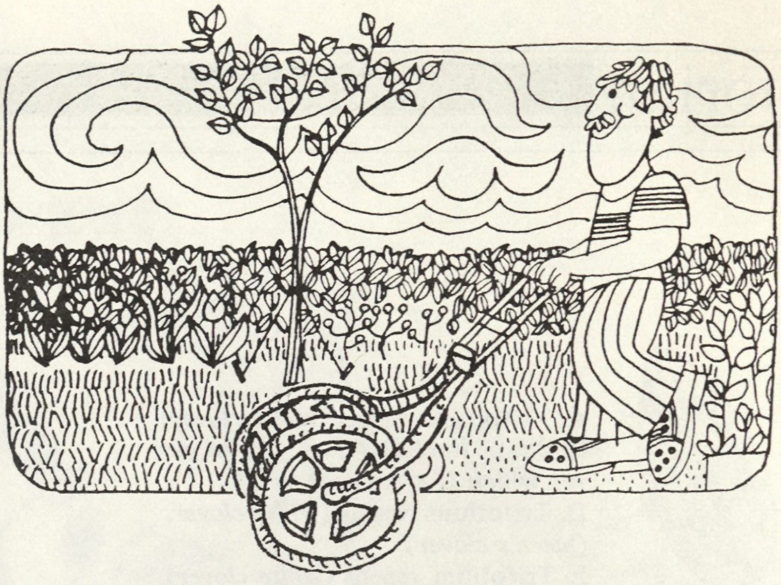
If you prefer to search for the elusive four-leaf clover, however, you should know that it appears as a somatic mutuation, which means that it will grow on the same plant which has the three-leaf clover. Therefore, if you find one plant with a four-leaf clover, keep looking – you're likely to find several on that same plant. For scientific inquiry, for fun, or for luck, on this St. Patrick's Day, be sure to have at least one kind of shamrock on hand. ■

The author is a graduate student in the Department of Ecology and Environmental Biology at The University of Connecticut in Storrs. The Natural Historian *is provided by The Connecticut State Museum of Natural History at UConn in Storrs – (203) 486-4460*

Lawnmowing in the 21st Century

by

Maryanne Lincoln



I DO NOT BELIEVE in cutting grass. I believe, to use William Niering's phrase, that "a lawn is a biological absurdity." I have allowed most of my yard to remain wild, filled with trees, bushes, and wildflowers to attract as many birds and butterflies as possible. The grass is not of any uniform variety, and in spring I carefully mow around the violets and quaker ladies. In summer I spare the hawkweed until it has gone to seed. Although the yard is so secluded that it cannot be seen from the street or by neighbors, I do take pleasure in caring for it. I like the looks and smell of freshly-mown grass. I like the contrast between wild and tamed when the job is finished. I like the exercise and the fresh air.

My first lawnmower was a wedding present. We had moved to four acres in the country, and it seemed as necessary as a refrigerator. It was a $1500, red, ride-on Wheelhorse. Its accessories included headlights and a cigarette lighter. Ten years and two divorces later, I had been reduced to an old Sears rotary mower in disrepair. A curious teenager with a short attention span had removed but not replaced the self-propelled mechanism. The mower was always hard to start -- often I was hot and tired before I even began mowing. The handle was loose again where it had already been welded. The machine could only be stopped by stalling it on a rock or in high grass or by risking a shock. I usually chose high grass. After stalling, it was impossible to restart unless it cooled down completely, a matter of hours or days. I began reading the ads.

One of the many ways in which the media try to fool us is in forgetting to tell us that an important part of the cost of a thing is the expense of running, maintaining, and repairing it. These costs should be factored in when considering any purchase. When buying something -- anything -- a voice should remind us that this is just one more thing that we will have to take care of. Each purchase brings a new responsibility. Sometimes what looks like progress turns out to be something else instead. Too often we take it for granted that progress means bigger, better, more. In my case, progress has turned out to be smaller, simpler, less.

A MODEL OF SIMPLICITY was Henry David Thoreau's sojourn at Walden Pond. People laughed at Thoreau when he said that he could walk to Fitchburg faster than he could get there by train. His explanation was that by the time he earned the 90 cents for the fare, he could have reached his destination on foot. I like to apply his formula to modern labor-saving devices, including lawnmowers. Following Thoreau's line of reasoning, I tried to estimate how long it would really take to cut the grass if I counted the hours I would have to work to buy a power mower and keep it fueled and repaired.

After studying the ads, weighing options, and consulting my checkbook, I ventured forth to replace the mower, I was hoping to spend less than $500.00, if possible. I found myself in Cheshire, at the wonderfully old-fashioned Hines' Hardware Store. That store has everything you could imagine, and more, including spikes for maple-sap tapping. That was where I found my new mower. It was in a box which fit neatly into the trunk of my compact car. It is a "Great States" mower. You start it by walking behind it and pushing.

I couldn't wait to get home and get the thing put together. This involved putting on the handles and the height bar, and took about 15 minutes. I carried it up the two steps from the driveway to the back yard. It can be lifted comfortably with one hand. Forty-five minutes later I was finished with the mowing, still cool and relaxed. I began to make a mental list of the benefits of using such a mower. No longer would I have to deal with the messy gasoline can. It took no longer to mow the yard this old-fashioned way than with a problem-riddled power mower. Because of its light weight, there were no ugly tracks in the grass. I was not hot and angry. I could stop and start at will. The smells of the grass, mint, and flowers were not overpowered by

Maryanne Lincoln has taught school for 25 years in Bethany, where she is a member of the Conservation Commission.

fumes and smoke. I could hear the sounds of the birds above the pleasant clicking of the blades. If the phone had rung, I would have heard that too. I put the mower away, pleased with it and with myself.

THE DOGS soon joined the fun. In the dangerous days of the rotary power mower, I had always shut them inside while I mowed. They would rush from window to window to watch my progress and to bark their encouragement. Every year I had read horror stories of people being maimed and killed in accidents involving power mowers. Sticks and rocks become dangerous weapons when flung by the blade. When my children grew to lawn-cutting age, I always harped on proper footwear and other safety precautions. Now the dogs romp around the yard while I mow. We are all happier.

As the weeks went on, I wondered if I would become disenchanted with my new toy, but I kept on finding new reasons to be satisfied. One day the handle fell apart. My quick assembly job had not included tightening all the nuts securely. One jiggled off into the grass and was not to be found. I replaced it with 11 cents worth of hardware. I laughed all the way home from the hardware store, thinking what repairs to the old mower had cost. I didn't have to wait two or three weeks for it to be fixed, either.

ONE OF THE BEST PARTS of having this new mower has been telling about it. Without exception, people have reacted with disbelief. So strong is the influence of business and advertising on our daily decision-making that everyone assumes that the more modern and expensive a thing is, the better it must be. "Not so," I tell them. "Try my new lawnmower." They hear me, but they do not listen. I have convinced only a few to try it before they invest hundreds of dollars in a new power mower. Oh, did I tell you? This one cost only $64.00. ■

Report from the Commissioner on Dioxin Levels

DEP Commissioner Leslie Carothers announced the first results of the study being conducted by the DEP to define the existing levels of dioxins in the ambient air before planned resource recovery facilities begin operations.

Recently, the DEP finalized its program to control emissions of dioxins into the air from these plants. This program includes the first ambient air quality standard in the nation for this compound -- one picogram per cubic meter -- and further limits the amount of dioxins that any single resource recovery facility can release into the air.

The study includes sampling near each planned resource recovery facility, as well as around the Windham Resource Recovery Facility, the one plant currently operating in the state. This sampling program includes two phases: one, prior to the operation of each facility; and a second, after the facilities begin processing waste materials.

The results of the sampling conducted near the mid-Connecticut and Bristol Resource Recovery Facilities indicated that background ambient dioxin levels ranged from less than 0.001 to a maximum value of 0.735 picograms per cubic meter around the mid-Connecticut facility and from less than 0.001 to 0.099 picograms per cubic meter contiguous to the Bristol facility. A picogram is equivalent to one trillionth of a gram.

A total of 33 samples at five separate locations was collected around the mid-Connecticut facility between August and October of 1987. Similarly, 19 samples were collected near the Bristol facility at three different locations during the same time period.

Samples have also been taken contiguous to the Bridgeport Resource Recovery Facility, and the DEP expects to get these results in the near future. Sampling will soon begin near the planned Wallingford facility and the Windham facility.

Upon completion of this first phase of the sampling program, the DEP will be collecting samples after the plants begin operation to help define the contribution that these facilities will have to the dioxin levels we breathe. It is expected that the facility impacts will be negligible, ranging from 0.009 to 0.037 picograms per cubic meter.

It should be noted, for interpreting these data, that the ambient standard for dioxin is an annual average and these first sampling data were collected over one- to two-day periods.

The results being released are for the first phase of this sampling program, which will cost approximately $600,000.

A final report on the data for the mid-Connecticut and Bristol facilities, including information on the precision and accuracy of these test methods, will be made public at a later date. ■

For Your Information

CEQ Rates State Environmental Programs

by
Leslie Lewis
Citizens' Participation
Coordinator

THE CONNECTICUT COUNCIL on Environmental Quality (CEQ) has recently released its 1987 annual report, *Connecticut Environment Review*. Each year the CEQ report has a general "Environmental Quality Index," along with two subject areas of particular significance. This year's topics include the Connecticut Environmental Policy Act (CEPA) and the DEP's land acquisition and management programs.

As in the past, the report begins with an overview of the state's air, water, land, and wildlife in the Environmental Quality Index. In addition, a section called "Emerging Issues" highlights the CEQ's most urgent concerns. These include the implementation of the *Environment/2000* plan, CEPA, land conservation, inland wetlands, groundwater, and pesticides.

CEPA, which was adopted in 1973, requires state agencies to examine the environmental impacts of proposed projects and to seek methods for avoiding or minimizing those impacts. The "Environmental Impact Evaluation" (EIE) and the "Finding of No Signficiant Impact" (FNSI) are documents which the agencies must prepare before they commence the projects. The CEQ, as one of the agencies charged with reviewing the EIEs and ENSIs, had numerous opportunities to observe the problems in the current system. The report summarizes the Council's findings as follows:

1.) The quality of the EIEs and FNSIs has been inconsistent and, on average, generally inadequate.

2.) FNSIs tend to be even more variable in quality (and generally poorer) than EIEs.

3.) EIEs and FNSIs are better at describing impacts associated with regulated activites like wetlands disturbance, noise, water pollution, and air emissions. Impacts on wildlife, vegetation, health and safety, non-regulated activites, are often inadequately addressed.

4.) Although CEPA requires financial disclosures from consultants who prepare EIEs, loopholes in the regulations prevent the measuring of overall compliance.

5.) CEPA requires an EIE to be completed before work on a project commences, but site selection is often made before the EIE is completed.

6.) Although CEPA requires the involvement of federal, state, and local agencies and the public in "scoping" the EIE, this is not commonly done.

7.) The CEQ finds that public particpation provisons of CEPA are inadequate.

8.) CEPA is widely misunderstood by the public, which believes that an EIS documenting significant environmental impact will result in the disapproval of a project. This will only happen if the agency sponsoring the project deems the impact to outweigh the benefit of the project.

9.) Although the state spends from $250,000 to $500,000 per year on EIEs and FNSIs and the potential benefits to the environment are great, the inadequacy of the current system prevents the quantification of those benefits.

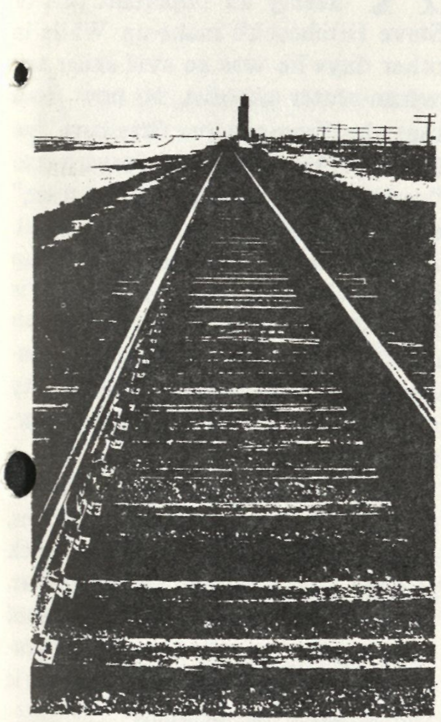
IN ORDER TO ADDRESS the shortcomings in CEPA, the CEQ has proposed several changes in the statutes. Most important among these amendments would be the adoption of a two-stage process, consisting of review of alternative sites and/or overall project configuration prior to project siting (Stage I). This is to be followed by Stage II, an EIE proposal for the project on the selected site. The second major change which the CEQ recommends is to require the sponsoring agency to submit a thorough "Record of Decision" to the Office of Policy and Management, explaining how the information in the EIE was used in the agency's decision-making process. This change would make it easier for those reviewing the EIEs to measure compliance with the CEPA process.

The CEQ report goes on to recommend nine other amendments to CEPA which would improve the quality of the decision-making under the Act and of the EIEs.

The second major subject area discussed in the report is the acquisition and management of land by the DEP. Many of the Council's concerns parallel those of the Land Conservation Coalition of Connecticut, which were discussed in the February, 1988, issue of the *Citizens' Bulletin*. The CEQ supports improvement in the planning and management capabilities of the DEP units involved in land acquisition and use. It also recommends the establishment of a dedicated fund or long-term bond authorization for the purchase of public lands, as well as calling for increased staffing for the DEP to administer current and future programs.

Copies of the CEQ Annual Report are available to the public at no charge. To obtain one, or for further information on the issues discussed therein, contact Karl Wagener, Executive Director, Council on Environmental Quality, 165 Capitol Avenue, Hartford, CT 06106, or call 566-3510. ■

Map of the Month



Walkin' the Line

by

Alan Levere

Senior Environmental Analyst

VERY RECENTLY, my ears perked up when I happened to overhear some people talking about trains. They were talking about a place in Connecticut where there was an old railroad bed. It was of some interest to me because of the grand scale of the engineering it took to put the track through the countryside. I knew this was a place I would have to visit.

When I finally did get a chance to go and explore the spot, I couldn't remember the exact location. So, I looked at the topographic maps I thought might be applicable, because -- as we know -- topography doesn't lie. I found what I was looking for, a winding, cointinuous dashed line (- - - - - -), signifiying an old, and now abandoned, railroad bed.

The nice thing about old rail beds is that even though the railroad service might be discontinued, the tracks torn up, and the depots preserved as restaurants, no one seems to go back and rebuild the hillsides that had to be blasted away, nor dig out the valleys that were filled to maintain a level track bed. What remains is actual history on the landscape, and in this case, it is depicted on the Moodus topo sheet.

THE POINT of the discussion I overheard was that the railroad had to span a valley about 1,000 feet wide and 120 feet deep. To make the cross-over, the designers had two options: They could build either a wooden or metal bridge over the void, or they could fill the entire vallley with rocks, dirt, etc., and have a permanent, raised, earthen roadbed. They chose the latter.

It was fall when I visited this spot and the weather was quite beautiful. The view from the top was a colorful reward, enhanced by the fact that there are no houses, malls, condos, shopping centers, or anything man-made in view, except a power line. As the ad says, it was "worth the trip from anywhere."

That "big fill" aspect of the railroad was only the tip of the iceberg. The actual road bed winds through many towns and villages on its way from the New Haven area to Boston. Much of the bed still remains intact.

And how is this information represented on the topographic map? The Moodus topo has the answers. The railroad bed itself is labeled "Old Railroad Grade," and, as a dashed line, it winds essentially east-west through the valleys of the area in a snake-like effort to maintain level ground. At the area of fill, the topo lines are parallel and quite close together, showing an intense steepness of slope. Since this V-shaped valley is widest at the top, the topo lines representing the top of the fill are longest. As the span narrows toward the valley floor, the fill is necessarily less wide at the bottom, as indicated by the shorter topo lines.

Dickenson Creek cut this valley and it flows into the Salmon River about a mile below the big fill. The river then flows under one of the best-looking covered bridges in the state -- the Old Comstock Bridge. A left hand turn off River Road just north of the bridge will take you right across the railroad bed where you can park and explore.

I DON'T KNOW FOR SURE how far the track bed goes on down the line, but then that's what the next trip will be for -- to find out what's around the next bend. Biking, anyone?

That, of course, is not all that is on the Moodus topo. An amazing number of ponds, lakes, and reservoirs dot the landscape; parts of six towns are depicted; and to the delight of hikers and hunters, quite a lot of this map is dedicated to open space in the form of the Salmon River State Forest. And, of the course, the Old Railroad Grade - - - - - -.

The Moodus topo can be ordered by sending $4.69 to cover the map, tax, and handling to: DEP, Natural Resources Center, Map Sales, Room 555, 165 Capitol Avenue, Hartford, CT 06106. (You can trace the rail line west on the Middle Haddam topo. Additional topos are $2.69.) ■

DEP Profile

A Man You Can Believe

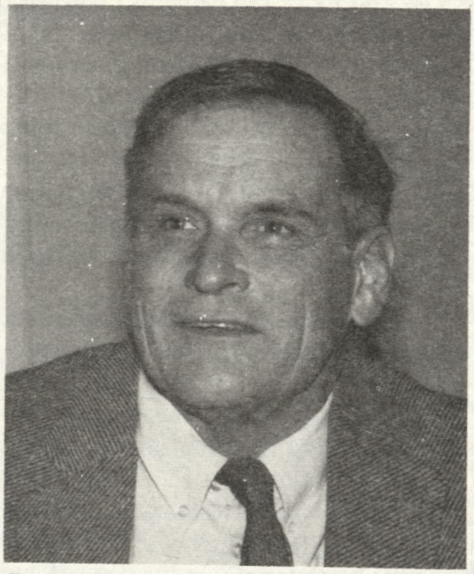
by

Robert Paier

ALMOST BY DEFINITION, the DEP's Hazardous Materials Management Unit is where the heaviest action is. The scope of its activities ranges from the oil and chemical spills emergency response team to pesticide applicator licensing; from leaking storage tanks to asbestos removal. Last year, this unit was involved in some 200 court cases involving violations of the state's hazardous materials laws. Directing the Hazardous Materials Management Unit is a big, complex, far-reaching, and very delicate job. To do it right, you have to have a clear sense of purpose, a fine-tuned scientific understanding, and nerve enough to back up what you say. At the HMMU, you get the feeling that it's always high noon. The ability to go out there and do what has to be done, no matter what, requires a certain dependability.

"The best compliment I ever had was from somebody who said to me, 'When I first heard it, I didn't believe it. But now that I've heard it from you, I know it's true.'" That's what you get with Steve Hitchcock – the pure stuff.

STEVE HITCHCOCK has been with the DEP since 1973. With a doctorate in entomology from the University of California at Berkeley, Steve had been a research entimoligist at the Connecticut Agricultural Station in New Haven for 15 years. "Entomology is a fascinating field," he says. "There are more species of beetles than there are of all fish, birds, and mammals combined, and there are many insect biologies which are unknown to us. The unknown is all around us, right in the back yard."



Steve Hitchcock, director of DEP Hazardous Materials Management Unit.

When Steve came to the DEP, it was just at the beginning of the new environmental awareness. It was a period, he says, of "youth and enthusiasm." It was also a time when things were simpler. "Today, when judgements are made on the basis of parts per million, or even smaller, the determination of the risk-benefit equation is much more complex than it used to be. It is very necessary that we in the DEP who are charged with maintaining a safe and healthy environment, keep the long view, that we listen, and try to understand the realities we are faced with. It is not enough to simply conform to the letter of the regulations."

Working at the cutting edge of things, aware of the fact that there are now widely-used chemicals whose dangers have not been ascertained, working at the critical point where the way things are meets the way we want things to be, means that Steve Hitchcock is a man walking a tightrope. Ever since he was a boy, growing up on the family farm in Vermont, he has had an intense, even poetic, love for the wilderness and the world of nature. On the other hand, his present responsibilities mean that he must be acutely aware of today's economic reality. "I'm afraid we have to understand that we just aren't going to get back to the Garden of Eden, or even to the way things were 300 years ago."

A FEELING for the wilderness is clearly an important part of Steve Hitchcock's make-up. While in other days he was an avid skiier and white-water canoeist, he now finds that the "competitive fires burn less fiercely." He is content, he says, just to "paddle around some lake or river," and to be able to see nature in its detail. Among the many writers that pop up in Steve's conversation, Thoreau is probably the most frequent. Thoreau said he had "traveled widely in Concord," a line which Steve feels is pretty much what he does in his present forays in the woods.

And there is writing. In additi to all his other interests, obligations, and accomplishments, Steve Hitchcock is also a widely published writer, whose work has appeared in *National Geographic*, *Yankee Magazine*, *Natural History*, and many other scientific and popular publications.

STEVE HITCHCOCK describ himself as "a mixed bag." Steve is both a very simple, straightforward man, and at the same time a man of many levels and complexity. There are echoes of things professorial about him, and an old-fashioned sense of plain decency and humility. It is not surprising to find that somewhere in this old Vermont farm boy there is at least a little bit of the Quaker view of the world.

A mixed bag, Steve Hitchcock. A lot of things going on at the same time. But the bottom line is, as the bott line should be, that Steve Hitchcock is a man you can believe. ■

Trailside Botanizer

A Family Gathering of Buttercups

by
Gale W. Carter
Illustrations by
Caryn Alleva

ALL MEMBERS of the buttercup family are not yellow. Some species may have blossoms that are pinkish, varying shades of blue, or even red and yellow, as in the columbine. The predominant color in this family is white.

Some members of the buttercup family appear at spring's awakening during the blustery winds of March. This is the time for the rue anemone (*Anemonella thalictroides*) to put forth its frail white blossoms along a stream bank, and for hepatica (*Hepatica americana*) to flaunt its flowers with their soft delicate hue as they emerge in a wooded nook near a melting snowbank.

This large primitive family consists of at least 1500 different species. Examples include buttercups, columbine, larkspur, monkshood, goldseal, anemone, gold thread, bugbane, baneberry, marsh marigold, and meadow rue, as well as the rue anemone and hepatica and some of the better-known garden species. Representatives of this family are found throughout North America. A few familiar species have moist habitats, but the majority inhabit woodland environments. Most species blossom in the spring, but others flower later in the year.

There are general characteristics that can be applied to this family, but there are exceptions. Usually members of this family have numerous stamens and many pistils. The petals are generally equal in size and separated from each other (that is, regular), but a few members have flowers that consist of petals of unequal size (irregular), such as larkspur and monkshood. The sepals look like petals, and petals may resemble stamens, or be tiny, or even missing.

©copyright 1988, Gale W. Carter

Swamp Buttercup
(*Ranunculus septentrialis*)

Many members of the buttercup family have finely-cut leaves or leaves that are divided into leaflets. Their seeds are often pod-like (follicles), but may be hard and one-seeded (achenes), while others are berry-like.

THE FOLLOWING are just a few representative plants from some of the genera. The various types of buttercup make up one of the most common groups found in this family. The genus name *Ranunculus* is Latin, meaning "little frog," as some members of the group grow in wet places. Some people think that the seeds of buttercups resemble a small frog.

Probably the best-known species of buttercup is *Ranunculus acris* – the tall buttercup. This plant, with its deeply-cut leaves and gilden cup-like flowers, blossoms from May to October. The flower has fine petals and numerous stamens and pistils. Its seeds are achenes. Look for this plant along roadsides and in old fields where it is moist.

The plant contains a substance which was once used to poison arrows.

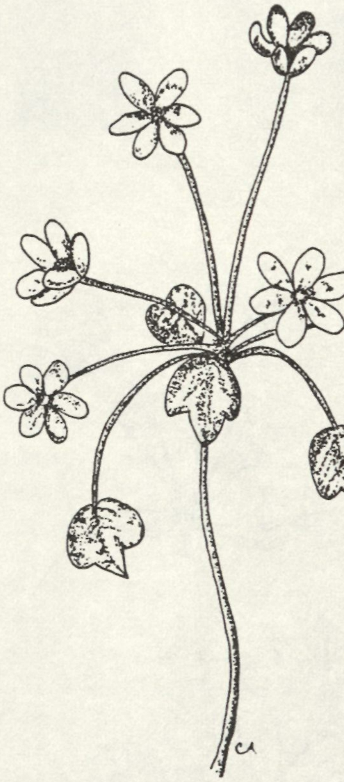
The poison gives the plant a bitter taste and is harmful to cattle if they eat the fresh plant. Drying destroys the poison.

Other buttercups include the swamp buttercup (*Ranunculus septentrionalis*), which likes moist areas; the abortive buttercup (*Ranunculus abortivus*), which is found on lawns and in woods; the bulbous buttercup (*Ranunculus bulbosus*) which is unique in the *Ranunculus* genus because of its bulbous root and which is also found on lawns; and the white water buttercup (*Ranunculus aquatilis*), which has stems that are submerged and flowers that float on the top of the water.

TWO COMMON MEMBERS of the genus *Thalictrum* are early meadow rue (*Thalictrum Dioicum*) and tall meadow rue (*Thalictrum polygamum*).

Early meadow rue is found in moist, protected woodland areas and in rock ravines. It grows to a height of two feet and has many small leaflets that are widely spread. Each leaflet is slightly three-lobed. The male and female flowers are on separate plants. Blossoming time is from April to May. Each flower has four or five sepals that resemble petals. There are many dangling stamens with yellowish anthers and numerous pistils. The flowers appear in drooping axillary or terminal clusters. Its fruit is an achene. Both *Thalictrum* and *dioicum* are Greek words, the latter meaning "two households." This refers to the fact that the male and female flowers are on separate plants. The common name, rue, suggests that this plant resembles an herb with a bitter flavor, something one would regret (rue) tasting.

The tall meadow rue may grow to a height of eight feet. It is found in fields, swamps, and along streambanks. This species flowers from June to August. It is a favorite flower of bees and butterflies. The flowers appear as white clusters and its structure is similar to that of the early meadow rue. Some plants of the tall meadow rue, as its species name *polygamum* indicates, have both sexes present, while others have only one sex present. There is an Indian belief that smoke from the tobacco made from this plant could cure deafness if it were blown into the ear.



Rue Anemone
(*Anemonella thalictroides*)

REPRESENTATIVE of the genus *Aqualegia*, wild columbine (*Aqualegia canadensis*) is a colorful wild species related to the common garden species. It grows in gorges, in fields, moist woodlands, and on cliffs, and reaches a height of two feet or more. The leaves are compound, being divided into many small-lobed leaflets. Its nodding flowers appear to be upside down. There are five red sepals that resemble petals and five regular petals which are straight, hollow spurs, each tipped with a nectar gland. These petals are red on the outside and yellow on the inside.

Each flower has many stamens and five pistils with slender styles. The blooming period is from April to June. Moths and butterflies pollinate the plant. The fruit is a dry pod (follicle) that splits down each side.

The genus name is from the Latin "aquila," meaning eagle, because of the resemblance of the spurs to the talons of an eagle. Its common name, columbine, is derived from the Latin word meaning "dove" because of the resemblance of the nectaries to heads of a group of doves clustered in a ring.

The fresh juice of columbine was once used by herbalists for the treatment of liver problems; they believed it would cure measles and small pox. During periods of famine, Indians boiled and ate the roots of the plant.

FROM THE GENUS *Cimicfuga*, bugbane (*Cimicfuga racemosa*), also called black snakeroot and black cohosh, is a plant of moist woodlands. It may reach a height of eight feet. Its leaves are thrice divided into many leaflets, each sharply toothed. The white feather-like flowers are borne on stalks that may be three feet or more. The feather-like appearance of the blossom is due to the numerous stamens. There are one to three pistils. Bugbane has white petal-like sepals and tiny petals, both of which drop off early.

The flower has a very disagreeable odor that keeps most insects away. Pollination is accomplished by carrion flies. The blossoming time is from June to August. Its fruit is a many-seeded follicle.

The generic name *cimex* is a Greek word meaning "bug," and *fugure* means "to drive away."

A tea made from the leaves was used by the early settlers as a treatment for diarrhea and rheumatism. The plant was also used to treat snakebite and the pains of childbirth.

WHITE BANEBERRY (*Actaea pachypoda*) is sometimes confused with bugbane, but is a smaller plant, growing up to two feet. It is a plant that grows in the shade in rich, moist, woodland areas. It is classified as a member of the genus *Actaes*.

The leaves of this species are divided two to three times into many leaflets that are sharply pointed. Its feather-like flowers bloom from May to June. The sepals and petals vary in number and soon fall off. There are numerous stamens but only one pistil, which has a broad stigma.

The most conspicuous feature of this plant is its fruit, which is oval, berry-like, and white. Its common name is "doll's eyes." This is because each fruit has a dark spot, resembling the eyes of a china doll.

The species name is derived from the Greek word *pachy*, meaning "thick," and *podas*, meaning "foot." This is a reference to the thickened fruit stalk that reddens as the fruit ripens.

The rootstalk and berries are very poisonous if eaten, but substances from the roots used in just the right concentration have been used for the treatment of neuralagia and urinary problems.

Red baneberry (*Actaea rubra*) is very similar in appearance. The main differences are in the color of the berry and the fruit stalk, which is not as thick.

UNLIKE OTHER members of the buttercup family, representatives of the genus *Clematis* consist of climbing vines.

Many colorful species have been introduced to cultivation but a common species that grows widely in the east is virgin's bower (*Clematis virginiana*). It is often found draped over bushes, along riverbanks, and covering fences. Virgin's bower is able to climb because its coiled leafstalks act as tendrils.

The leaves are divided into three leaflets which are arranged in pairs on the stem, and each leaflet is lobed. The white to greenish-white flowers appear in open clusters from July to September. There are four sepals but petals are absent. Stamens and pistils are numerous but vary in number and are often on different plants. Pollination is by small bees and flies.

The fruit appears in the fall and is a conspicuous, one-seeded, tailed achene. Collectively, the seeds resemble a twisted mass of fine feathers. One of the plant's common names is "old man's beard," so called because of the appearance of the fruit. The generic name *Clematis* comes from the Greek word *klems*, which means "vine branch."

All parts of the plant are toxic if eaten and the juice can cause severe skin irritation. ■

Wild Columbine
(*Aqualegia canadensis*)

The Bulletin Board

Marine Education

Project Oceanology, at Avery Point in Groton, announces a 1988 summer institute in marine environmental education for teachers, to run from August 8 to August 26. Learn about oceanography, water pollution, and coastal ecology by doing daily on-the-water and shoreline field studies. Classes conducted on-board a 50-foot research boat and in a waterfront marine laboratory using oceanographic equipment. Also, learn how to incorporate the study of the ocean environment in your teaching. All elementary and secondary teachers are eligible to participate. No pre-requisites. Six graduate credits through Eastern Connecticut State University. Tuition: $450. Camping and dormitory facilities available. For more information, write: Dr. Mickey Weiss, Project Oceanology, Avery Point, Groton, Connecticut 06340. ■

Land Acquisition

DEP Commissioner Leslie Carothers announced the purchase by the DEP of three signficant properties, totaling over 128 acres, for open space and park purposes.

Acquisition of the three properties, for a total of $939,000, was approved by the Bond Commssion in January. Funds for the acquisitions, which are located in the towns of Old Lyme, East Hampton, and New Hartford, will come from the Recreation and Natural Heritage Trust program. In addition, the purchase of two of the three properties was made possible through financial contributions from the Connecticut River Gateway Commission, and Ducks Unlimited, Inc.

"Connecticut is making great strides toward preserving needed open space lands," said Commissioner Carothers. "With these three purchases, we are beginning to prove that I am serious about my priority for land conservation. I intend to demonstrate our commitment to achieving the goal of acquiring 100,000 additional acres by the year 2000, and we expect to be submitting requests for land acquisition to the Bond Commission regularly." Carothers indicated that many of the acquisitions are expected to be funded through the Recreation and Natural Heritage Trust, a program created by the Legislature to preserve properties of important natural or recreational significance. ■

Museum of Natural History

The following events are scheduled at the Connecticut State Musuem of Natural History at The University of Connecticut at Storrs:

On Sunday, March 6, guided tours of the Greenhouses at the University of Connectiuct, with one of the most diverse collections of living plants in New England, will begin at 1, 2, and 3 p.m. The greenhouses are located at the rear of the Torrey Life Sciences Building on North Eagleville Road at UConn in Storrs. The greenhouses contain some 10,000 living plants, representing two thirds of all the plant families in the world, with more than 500 species of orchids, hundreds of cacti, and large tropical flowering food plants. The tours are co-sponsored by The Connecticut State Museum of Natural History and UConn's Department of Ecology and Evolutionary Biology, whose faculty do research on many of the plants in the greenhouses. The tours are free for Museum members; $2 per person for nonmembers. Reservations must be made in advance by calling (203) 486-4460.

On Sunday, March 13, at 3 p.m., "Dinosaurs, Dunes and Drifting Continents," a slide talk and booksigning by geologist/author Richard D. Little, will be in the Benton Connection Gallery, Jorgensen Auditorium Building, at UConn in Storrs. The lecture is co-sponsored by The Connecticut State Museum of Natural History and the UConn Co-op; free; refreshments after the lecture. ■

Connecticut Forest and Park Association

The following events are sponsored by the Connecticut Forest and Park Association:

April 7, Thursday, 7:30 p.m.: Tropical Rain Forest, Part I, lecture and slide program at the James L. Goodwin Forest and Park Center in Middlefield. An introduction to the topical rain forest, based on a journey to Panama. Discussion of the problems facing rain forests. Speaker: Joel Meisel, Professor of Environmental Studies, Southern Connecticut State University.

April 12, Tuesday, 8:15 a.m. - 4 p.m.: Woodland Dollars and Sense conference at the East Windsor Ramada Inn, 161 Bridge St., (exit 45 off I-91). Morning concurrent sessions: Wildlife Management Basic Forest Management, and Advanced Forest Management. The afternoon session: Keeping My Land Undeveloped – What Are The Options? Contact Steve Broderick, Extension Forester, Windham County Extension Service, Wolf Den Rd, Brooklyn 06234, 774-9600.

April 22, Friday: Arbor Day – plant a tree.

April 30, Saturday, 9:30 a.m.: Outdoor Photography Workshop. A great time of year to get your photography technique tuned up. Betty Goyette and Darryll Biorst will share their knowledge, techniques, and photographs with us. Bring your camera and lunch; coffee will be provided. Meet at the James L. Goodwin Forest and Park Center in Middlefield at 9:30 a.m. There is no charge for this worksho Co-sponsored by the Appalachian Mountain Club.

For more information about coming events, contact Linda Rapp at the James L. Goodwin Forest and Park Center, 16 Meriden Road, Route 66, Middlefield, Middletown, CT 06457. Phone: 346-2372. ■

Lifeguards Wanted

The DEP's Office of State Parks and Recreation is now accepting applications for the position of lifeguard. As a rule, the position will involve protecting established swimming areas, administering minor first aid, and doing beach-related work. During poor weather, lifeguards will work on other maintenance tasks.

The pay scale is graded in six-step increments, ranging from $5.00 to $6.00 per hour. A current CPR certificate, which is valid thorugh Labor Day, is required. Lifesaving certificates, however, are not required, nor are they accepted as proof of competency. Applicants must pass a competitive, physical examination in basic lifesaving techniques.

For further information and test schedules, please write: DEP, Office of State Parks and Recreation, Hartford, CT 06106, or phone: 566-2304. ■

Correction

In the article "Storing Your Home Heating Oil," by John Cimochowski, which appeared in the February, 1988, issue of the *Citizens' Bulletin*, an error occurred in the second last paragraph. The following should have appeared: "If one were to propose in-basement storage of heating oil, how could the underground (or in-concrete) piping problems be resolved? Two alternatives can reduce or eliminate the risk of piping leaks for 275-gallon in-basement tanks. The first alternative is to simply layout the fuel line above the floor to reach the furnace from the fuel tank. This could be accomplished by running the fuel line along the corner(s) of the floor and basement wall. If cementing over the line is desired to protect against its being crushed, it should be encased in a plastic sleeve *before* such cementing. A second alternative is to have a larger diameter plastic pipe set under the floor level that will provide an access line between the storage tank and the furnace. For new construction, the plastic line should be set below (and extending the ends above) finished basement floor level *before* the concrete floor is poured. The fuel line piping and fittings (copper) between the tank and furnace can then be slid into the larger pipe. Should the fuel line ever rupture, the fuel is contained and copper line can be easily replaced."

We regret any inconvenience caused by this error. ■

The Night Sky

by
Francine Jackson

We've been watching them come closer together for months, and now, the time is here for their closest approach. On March 6, Jupiter and Venus, the two brightest star-like images in the evening sky, will be within two degrees of each other in the west.

Since late summer, Venus has been rising higher and higher in the western sky, staying visible a few minutes longer each night. It is now reaching its greatest angular distance from the sun, about 45 degrees, allowing itself to be viewed like a brilliant beacon for up to three hours after sunset. Looking westward after dark, you will find Venus is unmistakable; no normal star comes close to it in brilliance.

If you've chanced going outside and looking up during any of this past winter's frigid but clear nights, you know that Jupiter has been visible in the south. Although it is only about one fifth the apparent brightness of Venus, you've probably noticed Jupiter more because it has been in a more conspicuous location. If you have observed it even casually every so often, you might have noticed that throughout the winter it has been steadily moving westward, until this month it will appear due west after sunset. And it will be next door to Venus on the sixth of March. It will continue traveling westward until it becomes lost in the sun's glare just a month from now.

Later this month, the crescent moon will join the planets in the west, passing just five degrees north of Jupiter on March 20, and only two degrees north of Venus the night after.

Finally, don't forget springtime. At 4:39 a.m., EST, Sunday, March 20, the sun will cross into the northern celestial hemisphere, and we can once more think seriously about trees and flowers and returning birds and the festival of Easter, which falls this year in April. Why? Let's wait until April to find out. ■

Endnote

"You don't *understand!* I could've had class. I could've been a contender. I could've been somebody. Instead of a bum, which is what I am. Oh, yes, I am. It was you, Charley."

Budd Schulberg

If every reader of the Citizens' Bulletin sent one gift subscription, friendships would deepen, more people would learn about the environment, and we would double our circulation.

It's so beautifully simple.

Please send a Citizens' Bulletin subscription to:

NAME: ____________________

ADDRESS: ____________________

TOWN: ____________________

STATE: ____________ ZIP: ____________

__$5/1 yr __$9/2 yrs

NAME: ____________________

ADDRESS: ____________________

TOWN: ____________________

STATE: ____________ ZIP: ____________

$5/1 yr $9/2 yrs

DEP Citizens' Bulletin
165 Capitol Ave., Rm. 112
Hartford, CT 06106

Gift card to read from: ____________________

____

DEP Citizens' Bulletin
State of Connecticut
Department of Environmental Protection
State Office Building
Hartford, Connecticut 06106

SECOND CLASS POSTAGE PAID
AT HARTFORD, CONNECTICUT